

# Claims

- [c1] A method of controlling a vehicle with a trailer comprising:
- determining a presence of the trailer;
  - determining a vehicle velocity;
  - determining a steering wheel angle;
  - determining a rear axle side slip angle of the vehicle; and
  - applying brake-steer to the vehicle when the rear axle slip angle is above a predetermined rear axle slip angle, the vehicle velocity is above a velocity threshold, and the steering wheel angle is about zero.
- [c2] A method as recited in claim 1 wherein determining the presence of a trailer comprises determining the presence of a trailer with a hitch sensor.
- [c3] method as recited in claim 1 wherein determining the presence of a trailer comprises determining the presence of a trailer with a reverse aid sensor.
- [c4] A method as recited in claim 1 wherein determining the presence of a trailer comprises determining the presence of a trailer with an ultrasonic sensor.

- [c5] A method as recited in claim 1 wherein determining the presence of a trailer comprises determining the presence of a trailer with a camera.
- [c6] A method as recited in claim 1 wherein determining the presence of a trailer comprises detecting a locating plate behind the vehicle.
- [c7] A method as recited in claim 6 wherein the locating plate comprises a locating hole positioned along the trailer tongue.
- [c8] A method as recited in claim 1 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.
- [c9] A control system for an automotive vehicle and a trailer comprising:  
means to determine the presence of the trailer;  
a vehicle velocity sensor generating a vehicle velocity signal;  
a steering wheel angle sensor generating a steering wheel angle signal; and  
a controller coupled to the means, the velocity sensor and the steering angle sensor, said controller determining a rear axle side slip angle of the vehicle, and when the rear axle slip is above a predetermined rear axle slip,

vehicle velocity is above a velocity threshold and the steering wheel angle is about zero, said controller programmed to apply brake-steer to the vehicle.

[c10] A system as recited in claim 9 wherein said means to determine the presence of a trailer comprises a hitch sensor.

[c11] A system as recited in claim 9 wherein said means to determine the presence of a trailer comprises a reverse aid sensor.

[c12] A system as recited in claim 9 wherein said means to determine the presence of a trailer comprises an ultrasonic sensor.

[c13] A system as recited in claim 9 wherein said means to determine the presence of a trailer comprises a camera.

[c14] A system as recited in claim 9 wherein said controller is programmed to brake-steer by applying a first brake and a second brake to reduce the turning radius of the vehicle.

[c15] A system as recited in claim 9 wherein said controller is programmed to brake-steer by applying at least one brake at a first wheel to reduce a vehicle turning radius.

[c16] A system as recited in claim 9 wherein said controller is

programmed to brake-steer by applying an increased drive torque to a second wheel relative to the first wheel.

[c17] A control system as recited in claim 9 further comprising a steering wheel angle sensor generating a steering wheel angle signal, said controller programmed to apply brake-steer in response to a reverse direction signal and the steering wheel angle signal.

[c18] A control system as recited in claim 9 further comprising a yaw rate sensor generating a yaw rate signal, said controller programmed to apply brake-steer in response to a reverse direction signal and yaw rate signal.

[c19] A control system as recited in claim 9 further comprising a steering wheel torque sensor generating a steering torque signal, said controller programmed to apply brake-steer in response to a reverse direction signal and steering torque signal.

[c20] A control system as recited in claim 9 further comprising a steering wheel angle sensor generating a steering wheel angle signal and a vehicle velocity sensor generating a vehicle velocity signal, said controller programmed to apply brake-steer in response to the reverse direction signal and steering wheel angle and vehicle velocity signal.

- [c21] A method of controlling a vehicle with a trailer comprising:
- determining a presence of the trailer;
  - determining a vehicle velocity;
  - determining a hand wheel angle position signal corresponding to an angle of the hand wheel angle position;
  - determining a sensor yaw rate from a yaw rate sensor;
  - calculating a yaw rate based upon the hand wheel signal;
  - determining a rear axle side slip angle; and
  - applying brake-steer to the vehicle when the rear axle slip angle is above a predetermined rear axle slip angle, the vehicle velocity is above a velocity threshold, and the sensor yaw rate is diverging from the hand wheel yaw rate.
- [c22] A method as recited in claim 21 wherein determining the presence of a trailer comprises determining the presence of a trailer with a hitch sensor.
- [c23] A method as recited in claim 21 wherein determining the presence of a trailer comprises determining the presence of a trailer with a reverse aid sensor.
- [c24] A method as recited in claim 21 wherein determining the presence of a trailer comprises determining the presence of a trailer with an ultrasonic sensor.

- [c25] A method as recited in claim 21 wherein determining the presence of a trailer comprises determining the presence of a trailer with a camera.
- [c26] A method as recited in claim 21 wherein applying brake-steer comprises applying at least one brake at a first wheel to reduce a vehicle turning radius.